



APR 11 2005

**TRANSMITTAL
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Total Number of Pages in This Submission

Application Number 09/667,534

Filing Date September 22, 2000

First Named Inventor ITARU SETA

Art Unit 2623

Examiner Name V. Kibler

Attorney Docket Number 032405.056

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Date

April 6, 2005

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No. 09/667,534
Applicant(s): ITARU SETA
Filed: September 22, 2000
TC/A.U. 2623
Examiner: V. Kibler
Title:

Confirmation No.: 5746

**DISTANCE CORRECTING APPARATUS OF SURROUNDINGS
MONITORING SYSTEM AND VANISHING POINT CORRECTING
APPARATUS THEREOF**

Docket No.: 032405.056
Customer No.: 25461

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST FOR RECONSIDERATION

Reconsideration is respectfully requested of the Final Office Action of January 6, 2005, relating to the above-identified application.

The claims in the application are Claims 1-21.

The present application relates to the distance correcting apparatus of a surroundings monitoring system wherein a stereo imaging means is provided for stereoscopically taking a pair of images, including a reference image and a comparison image;

a parallax calculating means is provided for calculating a parallax based on the pair of images obtained from the stereo imaging means by calculating a horizontal deviation amount between the reference and the comparison images;

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LIT902294.1

a distance calculating means is provided for calculating a distance to an object based on the parallax and a first parameter for correcting the distance;

an approximation line calculating means is provided for calculating a plurality of approximation lines extending in the distance direction in parallel with each other based on the images;

a vanishing point calculating means is provided for calculating a vanishing point of these images from a point of intersection of the approximation lines,

and a parameter correcting means is provided for correcting the first parameter based on the vanishing point.

Thus, the stereo matching process or the process of calculating a parallax and the structure for correcting a distance based on the vanishing point in the cited reference (Abstract of JP 6-341837, *Yasui*) are different from those of the present invention. Accordingly, applicants respectfully submit that the rejection of Claims 1-5 and 8 under 35 U.S.C. § 102(d) in view of *Yasui* is improper and should be withdrawn¹. Reconsideration is respectfully requested based on the fact that Claim 1 is a means plus function claim, wherein the parallel calculation means calculates the parallax based on the deviation amount of matching areas of the left and right images; that is, the reference and comparison images.

Yasui measures the distance to a vehicle in front by photographing right and left road images, detecting white lines by running lane detection means, finding their vanishing point, using symmetry axis detection means to find the symmetry axes of the vehicle in front, finding

¹ It is noted that only the Abstract has been provided to applicants and, therefore, only the Abstract is available as the reference against these claims. Should the PTO provide applicants with a full translation, reopening of the prosecution is requested.

parallaxes by right and left parallax extraction means, and measuring the distance to the vehicle in front by using the parallaxes.

Moreover, applicants point out that the present invention as recited in Claim 1 provides means for calculating a distance to an object based on the parallax and the first parameter. In contrast, *Yasui* calculates the distance to an object based on the equation $D = Lf/dl + fr$ (wherein $dl+dr$ = a parallax, L = an interval between cameras; and f = a focal distance of lens) which would not correspond to the first parameter of Claim 1. Consequently, applicants respectfully submit that the cited reference fails to describe all of the features of Claim 1 and, therefore, is not a proper reference under 35 U.S.C. § 102 since the reference fails to anticipate every feature of the claimed invention. For the same reason, the dependent Claims 2-5 and 8 are similarly not properly rejectable as being anticipated by the *Yasui* reference. Accordingly, applicants respectfully request reconsideration and withdrawal of this rejection.

The rejection of Claims 11-15 and 18 under 35 U.S.C. § 103 as unpatentable over *Yasui* (Abstract JP 06-34187) is traversed and reconsideration is respectfully requested.

Claim 11 differs from Claim 1 *inter alia*, by calling for a transforming means for geometrically transforming the reference and comparison images based on a first parameter indicating a transference in the horizontal direction. The *Yasui* reference fails to disclose a structure where the geometrical transforming amount of both images in the stereo images is corrected based on the vanishing point, followed by both images being geometrically transformed based on the corrected geometrical transforming amount.

The Official Action alleges that it would have been obvious to one of ordinary skill in the art to have modified the pair of stereo images to include a geometrical transformation.

However, the Official Action completely fails to set forth any motivation as to why a person skilled in the art would be lead to modify the *Yasui* device with the expectation of achieving a desirable result.

Accordingly, applicants respectfully submit that *Yasui* fails to establish *prima facie* obviousness of the claimed invention in Claims 11-15 and 18.

The rejection of Claims 6, 9, 10, 16 and 19 under 35 U.S.C. § 103(a) as unpatentable over *Yasui*, further in view of *Saneyoshi, et al.* (US 5,410,346), is traversed and reconsideration is respectfully requested.

Claim 6 is dependent upon Claim 4, which in turn is dependent on Claim 2, which in turn is dependent on Claim 1 and further defines the reference object detecting means for calculating a lane marker model expressing a change of the road surface height with respect to the distance and a first parameter correcting means which identifies a change in the condition of the actual road surface height based on a vanishing point calculated by the vanishing point calculating means.

The *Yasui* Abstract fails to disclose means for calculating a lane marker model, as admitted in the Official Action.

The Official Action relies on the secondary reference of *Saneyoshi* to allegedly establish that it is known to include a lane marker model expressing a change of the road surface height with respect to distance and to identify a condition of change of an actual road surface height and to correct parameters so the change condition of the calculated road surface height comes close to the change condition of the actual road surface height. The Official Action alleges that it would have been obvious to have modified the vanishing point to include a lane marker

model based on the allegation that *Saneyoshi* teaches that it allows for precise distance to be obtained by a relative discrepancy of the position of the left and right pictures.

However, there is no reason, suggestion or motivation in *Saneyoshi* whereby a person skilled in the art would conclude that the system shown in the *Yasui* Abstract could be improved or benefited by incorporation of the system shown in the *Saneyoshi* patent. Moreover, the *Yashu* Abstract is defective and lacking the features of the invention as discussed above. Accordingly, applicants respectfully submit that the combination of the *Yasui* Abstract and *Saneyoshi* fails to establish *prima facie* obviousness for the subject matter of Claims 6, 9, 10, 16 and 19; and, therefore, the rejection should be reconsidered and withdrawn.

The rejection of Claims 7 and 17 under 35 U.S.C. § 103(a) as unpatentable over *Yasui* taken with *Saneyoshi* as applied to Claims 4 and 14 and further in view of *Azuma, et al.* (US 6,163,337), is traversed and reconsideration is respectfully requested.

The Official Action admits that *Yasui* and *Saneyoshi* do not recognize including the use of gradients. The *Azuma* reference is relied on to show gradients to evaluate the reliability of parallax estimation. However, there is nothing in *Azuma* which would suggest to a person skilled in the art that a benefit or improvement in the system of *Yasui* could be obtained by modifying the *Yasui* apparatus to include the features of *Azuma*. Furthermore, *Yasui* is defective for the reasons discussed above.

Accordingly, applicants respectfully submit that the combination of *Yasui*, *Saneyoshi* and *Azuma* fails to establish *prima facie* obviousness of the subject matter of Claims 7, 8 and 17. Applicants therefore respectfully request reconsideration and withdrawal of this rejection.

The rejection of Claim 20 as unpatentable under 35 U.S.C. § 103(a) in view of *Yasui*, taken with *Kise* (JP 10-307352) is traversed and reconsideration is respectfully requested. The *Yasui* Abstract is discussed above and all the comments apply here as well. The Official Action admits that *Yasui* does not disclose correcting an established vanishing point so that the established vanishing point comes close to the calculated vanishing point.

The Official Action relies on *Kise* to show correcting an established vanishing point so that the established vanishing point comes close to the calculated vanishing point. However, the Official Action fails to point out any reason, suggestion or motivation in *Kise* whereby a person skilled in the art would be lead to modify the *Yasui* system with the expectation of achieving a benefit or improvement. Consequently, applicants respectfully submit that the Official Action fails to make out a case of *prima facie* obviousness and therefore, request withdrawal of this rejection.

The rejection of Claim 21 under 35 U.S.C. § 103(a) as unpatentable over *Yasui*, taken with *Kise*, and further in view of *Saneyoshi*, is traversed and reconsideration is respectfully requested.

The Official Action admits that neither *Yasui* nor *Kise* recognize including a time-versus change of the position of the lane marker projected in the images. The *Saneyoshi* reference is relied on to show that it is known to include a time-versus change of the position of a lane marker. The Official Action alleges that it would have been obvious to modify the vanishing point calculating means disclosed by *Yasui* and *Kise* to include the time-versus change of the position of the lane markers as taught by *Saneyoshi* allegedly because it is well known and allows for change in the road shape due to curves or unevenness. However,

applicants respectfully submit that the Official Action fails to suggest an adequate reason or motivation for a person skilled in the art to make such a change. The references fail to provide any reason whereby a person skilled in the art would be lead to believe that improved results could be obtained in the *Yasui* system by including the modifications as proposed in the Official Action.

In summary, applicants respectfully submit that the Official Action fails to establish *prima facie* obviousness for the claimed invention and, therefore, the rejection based on the combination of the three references should be withdrawn.

Favorable action at the Examiner's earliest convenience is respectfully requested.

Respectfully submitted,

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